1. PROJECT CODE	2. JPIC CODE	AMS-02 TASK SHEET (ATS)
SA-AMS	AMS	

3. TYPE				4. ATS NO.	5. PAGE
A	CONFIGURATION CHANGE	☒		TTCS-BOX-HX-001	1 OF 31
	PERMANENT ☐ TEMPORARY	☒	6. MOD SHEET(S) NUMBER(S)		
B	NONCONFIGURATION CHANGE	☐			

10. PART NAME	11. Sub Detector Name	12. SERIAL/LOT NO.
AMS02	TRACKER-TTCS BOX	NA

14. APPLICABLE DOCUMENTS

18. ATS TITLE

TTCS-HX Sub-assembly installation FM-S

20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	23. QA/DV

NOTE CAUTION WARNING

THIS ATS COVERS ALL THE INTEGRATION STEPS NEEDED FOR THE TTCS-HX INSTALLATION

The purpose of this ATS is to specify the HX installation of the TTCS boxes, that will be performed at AIDC Taiwan.

The Project Engineer: Johannes van Es (TTCS) has the option to reorder steps on site as required.

HANDLING AND HARDWARE INSTALLATION

Each operation on FM Hardware shall be done wearing gloves and in according to the following instructions

All the integration activities shall be done by qualified personnel.

The TTCS Project Engineer has the authority to work the steps in this ATS out of order.

24. ORIGINATOR	DATE	25. FINAL ACCEPTANCE STAMP AND DATE
J. van Es		

APPROVALS *(Printed or Typed and Signed)*

26. PROJECT ENGINEER	DATE	27. QUALITY ENGINEER	DATE
J. van Es			
28.		29.	
30.		31.	

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		22. TECH	23. QA/DV

SCOPE

The purpose of the present document is to provide information and guidelines for the installation of the TTCS Heat Exchanger on its support and the installation into the TTCB.

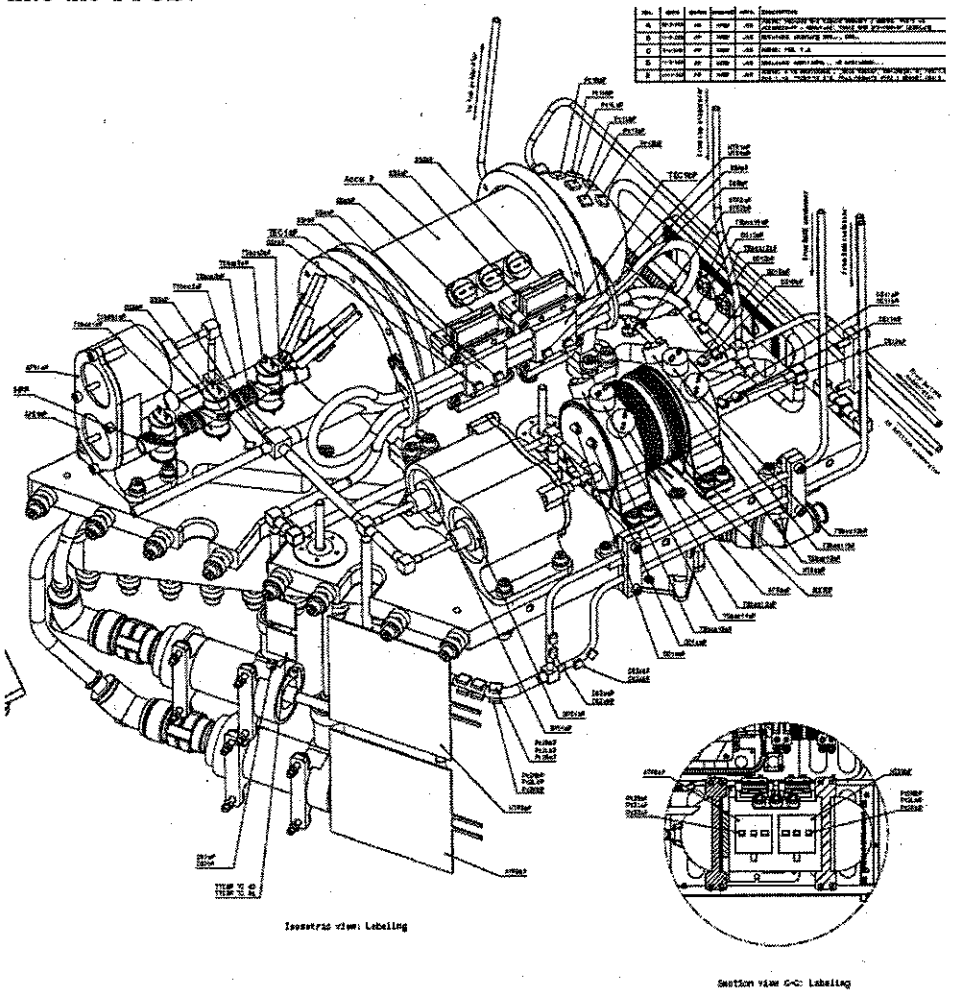

Figure 1

TTCS HEAT EXCHANGER INSTALLATION INTO THE TTCB

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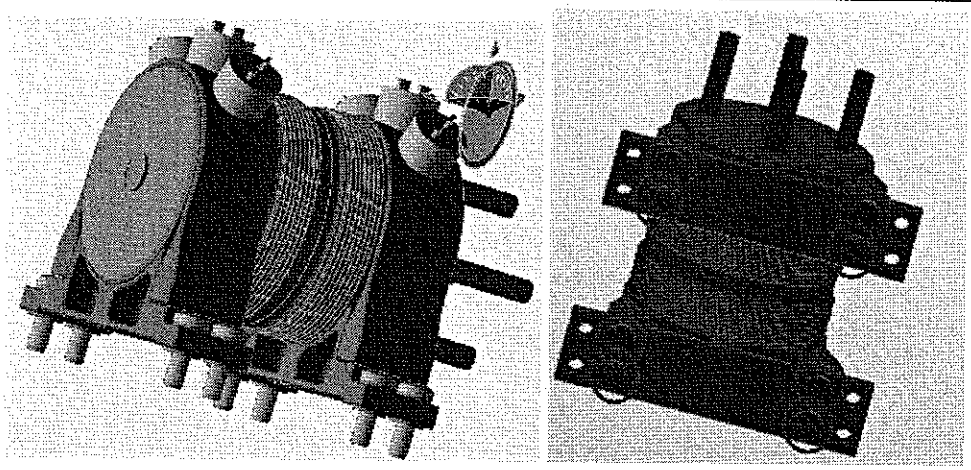

Figure 2

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APPLICABLE DOCUMENTS

The following documents in the latest applicable issue form a part of this plan to the extent specified herein:

AD	Document ID	Issue/Rev	Title
1	ET6029-04-031	F/	ASSY HX FM P
2	ET6029-04-019	H/	HX FM P CLIP AND SUPPORT
3	ET5998-06-10	D/	TTCB FM Assembly base
4	ET5998-06-01	E/	ASSY TTCB P FM

STANDARD AND SPECIAL TOOLS

For the hardware installation a standard tool shall be used.
Where the use of standard tooling is not possible, special tool may be employed.
Each special tool has to be identified with its Drawing Number marked, in indelible way, on the same tool
All the tools have to be clean and free from dust and grease.
For the present installation only standard tools are needed

RUNNING TORQUE MEASUREMENT

In the present integration activity we have to consider only two types of locking as coupling. One by Insert Thread Locked In (MS21209 F1-20L .19-32 UNF 3A) and screw (MS2469C52 .19-32 UNF 3A).
And the second type by insert MS21209F1-15
The expected Locking (running) torque value, relative to MS2469C52 and NAS 3151-N3-10 screw is reported in the following table. This value is an output from Specification MIL-I-45914A

BOLT TYPE	BOLT SIZE	MIN LOCKING TORQUE [in*lbf]	MAX LOCKING TORQUE [in*lbf]
MS2469C52	.19-32 UNF 3A	~~1 (TBC)~~ 2	~~6 (TBC)~~ 18
NAS 1352-N3-10	.19-32 UNF 3A	~~1 (TBC)~~ 2	~~6 (TBC)~~ 18

Since it is a continuous torque it is necessary to measure it with an analogical torque wrench, obtaining the maximum torque applied during this operation.
The Locking Torque value has to be written in the relative box in the Integration Procedure Table and added to the Seating Torque required in the structural analysis, (and reported in the engineering drawings)

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FINAL INSTALLATION TORQUE MEASUREMENT

Final Torque to be applied to each screw is the result of the sum of the Locking Torque (measured) and the Seating Torque prescribed from the structural analysis (and reported also on the engineering drawing).
The Seating torques to be applied for each screws are listed in this ATS
The entire torque shall be applied using calibrated torque wrench

TORQUE (T)= SEATING TORQUE (ST) +LOCKING TORQUE (RT)

- SEATING TORQUE (from structural analysis)
- LOCKING (= RUNNING) TORQUE (measured)

LUBRICATION

All these fasteners shall be installed in LUBRICATED condition (according to the structural analysis)

The below Step by Step procedure, have to be followed for all the fittings to be used for the parts installation.

STEP	OFF-LINE MEASUREMENT STEPS
1	Clean screws and washers in an Isopropyl Alcohol bath
2	Let the screws and washers dry on a clean towel
3	Perform a screws and washers visual Inspection
4	Install the HX supports on the HX dummy support plate fasten by hand the screws of the intended tube side of the HX and torque with tool to 75% of the final torque value
5	Fasten the screws of the support on the non-tube by hand loosely so 2 mm room is left between bolt and support
6	Install the HX on top of the supports in the correct orientation
7	Install the clip on the HX tubes side on the HX support. Fasten the clip screws alternating by hand.
8	Torque the 4 bolts to a value of 80% of the final torque
9	Measure on both sides the room between clip and support with spacers (thickness gauging tools)
10	Design & manufacture shims for the side with the largest spacer thickness based on the measured spacer thickness.
11	With clip 1 still installed perform the steps 8-10 for the clip 2 (non-tube side). In this case the support could be slightly lifted from the dummy base plate due to the non-concentricity of the HX.

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	12 When still installed measure the gaps (dislocation) of the HX support (at the non-tube side) compared to the dummy base plate by spacers (thickness gauging tool). Perform this for all 4 bolts individually.		
	13 Design and manufacture washers with a thickness of the washers at the tube side plus the measured thickness by the spacers (4 or 2 sizes depending on the results)		
	OFF-LINE INSTALLATION STEPS		
	1 Install the HX supports with correct washers (AS DESIGNED ABOVE) on the HX dummy support plate fasten by hand the screws of both supports to 75% of the final torque value		
	2 Install the HX on top of the supports in the correct orientation		
	3 Install the clip AND SHIMS on the HX tubes side on the HX support. Fasten the clip screws alternating by hand.		
	4 Measure the Locking Torque and register the value in the Integration Procedure Tables The Integration Procedure Tables are part of the present document Torque the 4 bolts to a value to the final torque		
	5 With clip 1 still installed perform the steps 6-7 for the second clip (non-tube side).		
	6 De-install the HX supports from the HX dummy base plate		
	ON-LINE OPERATION		
	1 Clean screws and washers in an Isopropyl Alcohol bath		
	2 Let the screws and washers dry on a clean towel		
	3 Perform a screws and washers visual Inspection		
	4 Install the HX-support assembly with the washers to the TTCB-P base plate		
	5 Measure the Locking Torque and register the value in the Integration Procedure Tables The Integration Procedure Tables are part of the present document		
	6 Torque the bolts to the final torque values		

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1. Open this ATS

2. Perform the following preparatory work.

2.1 Prepare the TTCS HX for installation. Perform a visual inspection of the parts to be installed (HX); clean the parts to be installed (HX) with Isopropyl Alcohol and let the parts to be installed dry on the clean towel

2.2 Prepare screws and washer to be used for the part installation. Perform a screws and washer visual inspection; clean screws and washers in an Isopropyl Alcohol bath and let screws and washers dry on a clean towel

2.3 Perform a visual inspection of the TTCS Heat Exchanger; check the cleanliness of all the inserts. If necessary clean them with Isopropyl Alcohol

2.4 Prepare the installation dummy plate for installation. Perform visual inspection and clean the part with Isopropyl Alcohol and let the part dry on a towel.

2.5 Weight all the hardware to be installed, including fasteners. Record the weight

ITEM	WEIGHT
~~AHS 1351 AN3-10~~	
MS24694 C52x8EA	18.33 g
HX	1299.29 g
Bracket Tube side	197.75 g
Bracket No tube side	197.59 g

C.C. yeh JCH

SCALE

PN AIDC NO. 32010757 M# _____ Cal Date 8/14/2009 Exp

2.6 OFF-LINE MEASUREMENT STEPS

2.6.1 HX Installation onto support.

WARNING: for HX FM1 installation reference drawings are:

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Assembly drawing:..... ET6029-04-DR-031-F
Clip drawing:..... ET6029-04-DR-019.1-H
Support: ET6029-04-DR-019.2-H

Verify before use the availability of the approved drawing revision

2.6.2 Check the bill of material in the assembly drawing.

2.6.3 Put the installation dummy plate on a flat surface.

2.6.4 Install the two HX supports on the dummy HX installation base plate as shown in the figure.
Install bolts washers as on the figure below

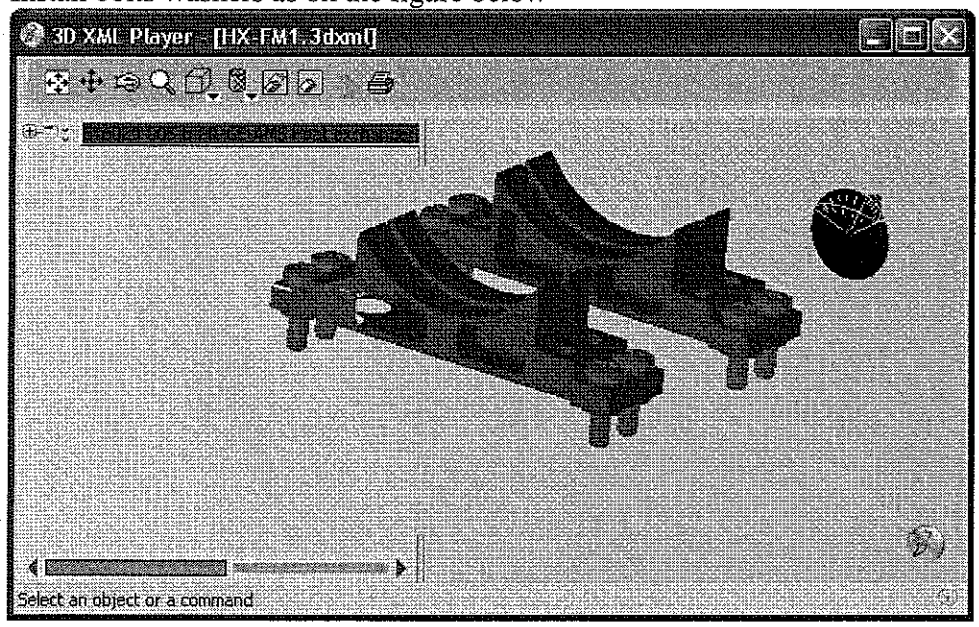

Figure 4: Installation of HX supports to dummy base plate

2.6.5 Apply a thin layer of [redacted], to the threads of each bolt prior the installation (as reported on the assembly drawings).

Braycote Grease - PN 601 EF 25012-AMSB Lot# 135999 Exp. Date 053023 052828 DOM: 060208

2.7 Torque only the bolts of the support on the side where the tubes of the HX will be located to 75% of the final seating value (for positioning).
Final torque values are shown in below table

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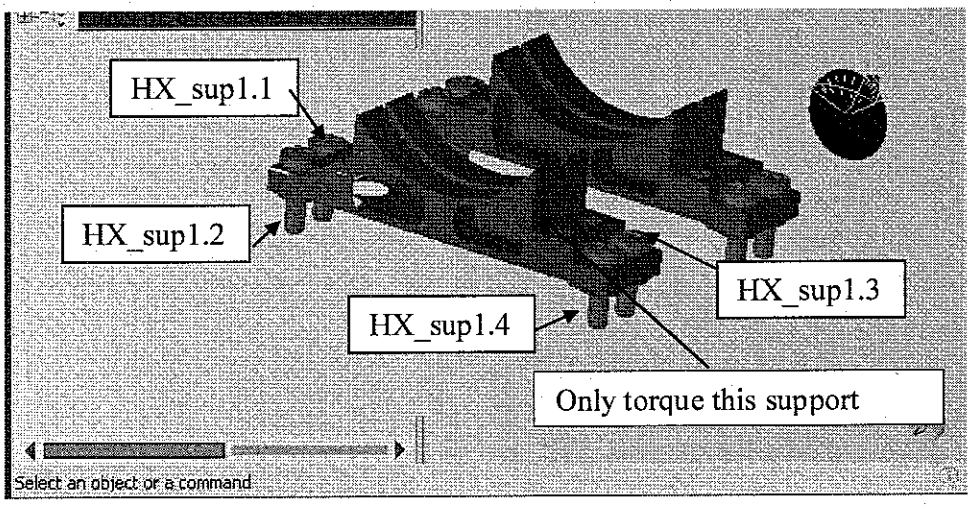
Dash Number	Torque (in*lbf)	
	Max	Min
SCREW, SOCKET HEAD CAP 10-32 UNF-3A X 1.00 LG	40.2	33.5

Torque the fasteners installed in Step 2.7. Locking torque shall be 1-6 inch*lbf. (TBC) Final torque shall be 75% final seating torque = 31.65-26.93 inch*lbf above locking torque.
5% precision on torque.



Torque Wrench- Locking Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009

Torque Wrench- Final Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009

Bolt	Locking Torque	Final Torque (for positioning)
HX-sup1.1	1	31
HX-sup1.2	6	36
HX-sup1.3	7	37
HX-sup1.4	9	39

c.c. Tel JCH

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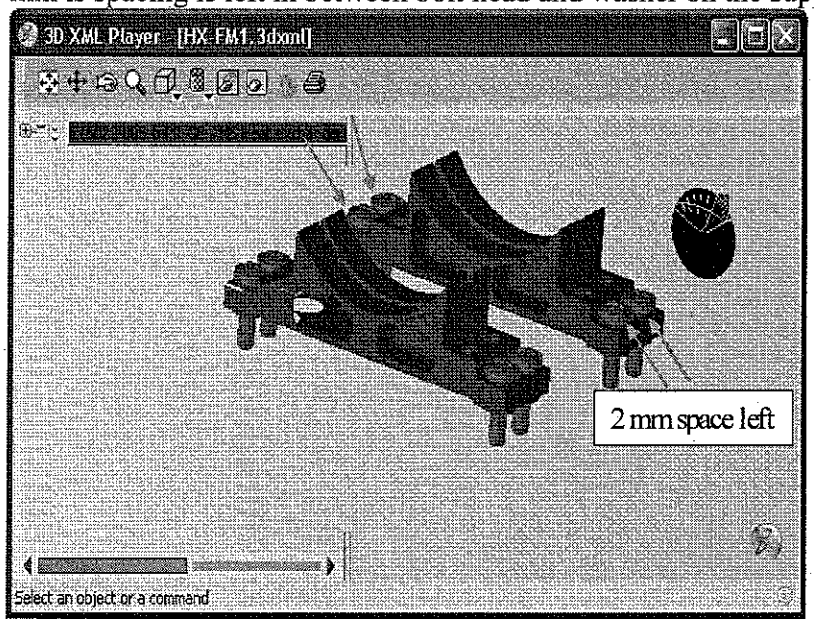
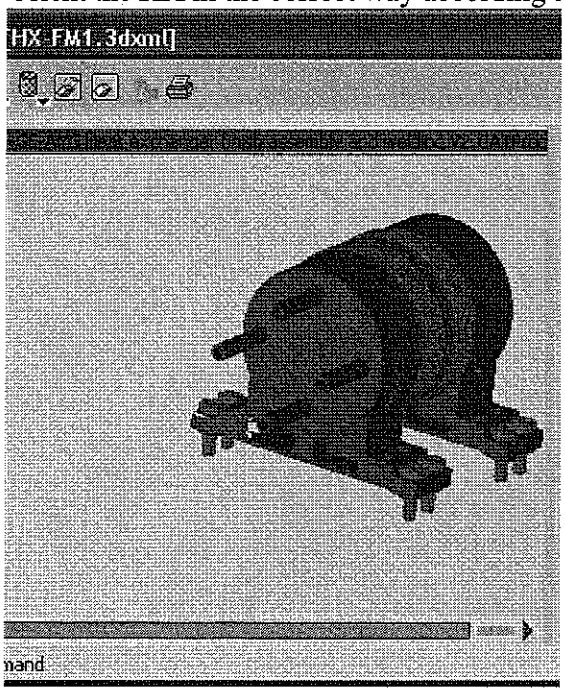
20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	VERIFICATION 23. QA/DV
2.7.1	Leave the bolts on the other support **untorqued** and screw by hand until 2 mm is spacing is left in between bolt head and washer on the support. 		
2.7.2	Install the HX on the two-supports Orient the HX in the correct way according to AD 1. 		

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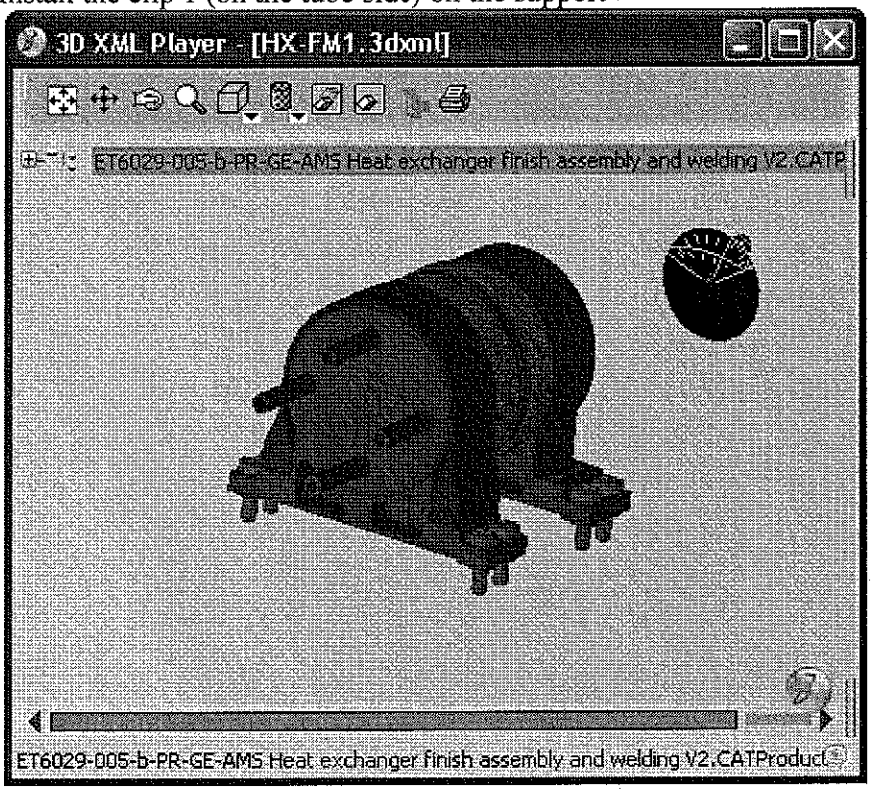
20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	VERIFICATION 23. QA/DV

2.7.3 Install the clip 1 (on the tube side) on the support



2.7.4 Apply a thin layer of [redacted], to the threads of each bolt prior the installation (as reported on the assembly drawings

2.7.5 Fasten the screws alternating on both sides by hand and torque to 80% of the total torque.

Dash Number	Torque (in*lbf)	
	Max	Min
[redacted]	10.6	9

Torque the fasteners installed in Step 2.7.3. Locking torque shall be 1-6 inch*lbf. (TBC) Final torque shall be 80% **final seating torque = 8.48-~~6.75~~ 5.20 inch*lbf above locking torque.**
5% precision on torque.

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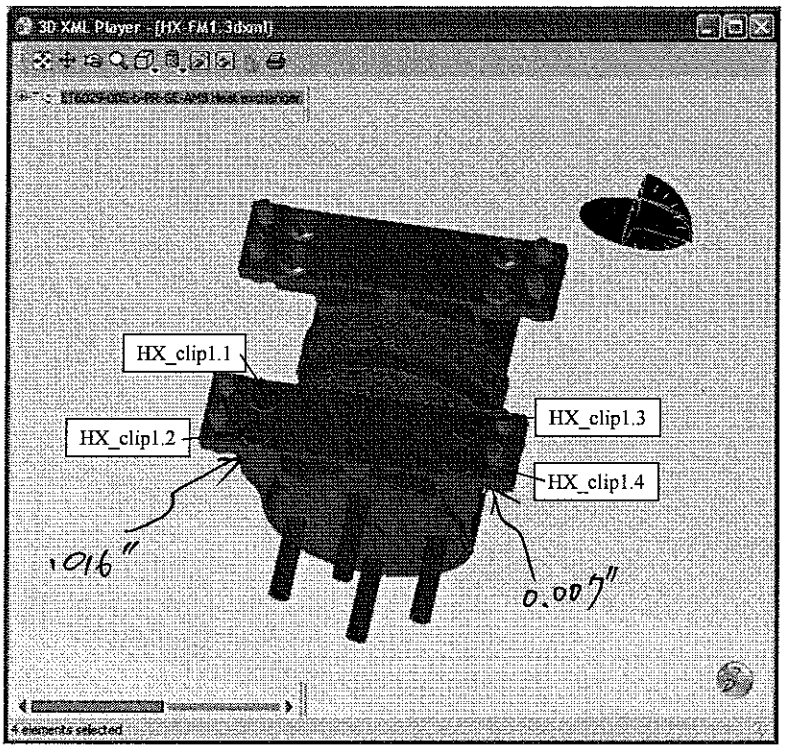
Torque Wrench- Locking Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009

Torque Wrench- Final Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009



Bolt	Locking Torque	Final Torque (for positioning)
HX-clip1.1	11	19
HX-clip1.2	11	19
HX-clip1.3	12	20
HX-clip1.4	10	18

JCH

C.C.-Jeh

2.7.6 Measure the shim thickness between clip and support on both sides of clip 1 with spacers (thickness gauging tools).
Spacer thickness is {(Thickness left + thickness right)-2*0.01"}/2.
In case the spacer thickness < 0.01" use only 1 spacer
In case spacer thickness < 0.005" use no spacers
In case spacer thickness is < 0 machine off the clips so there is a gap of 0.005"

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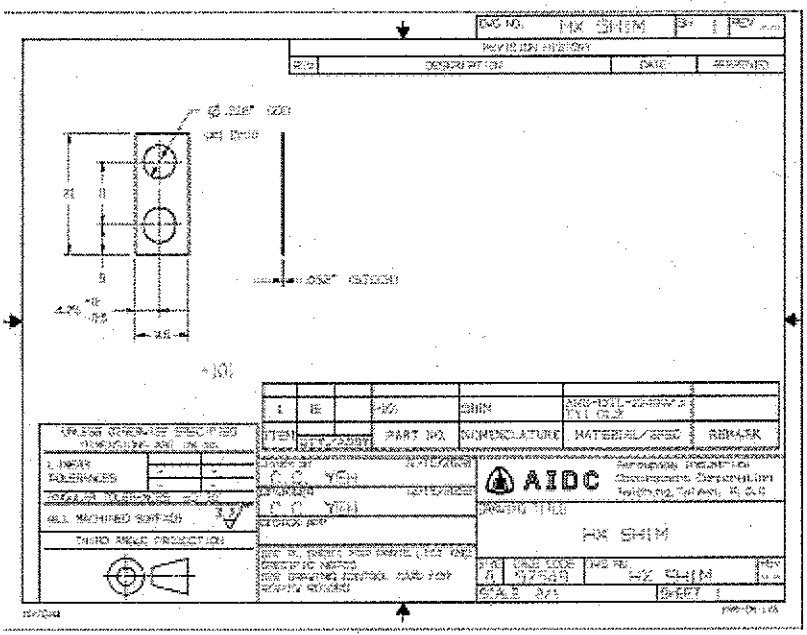
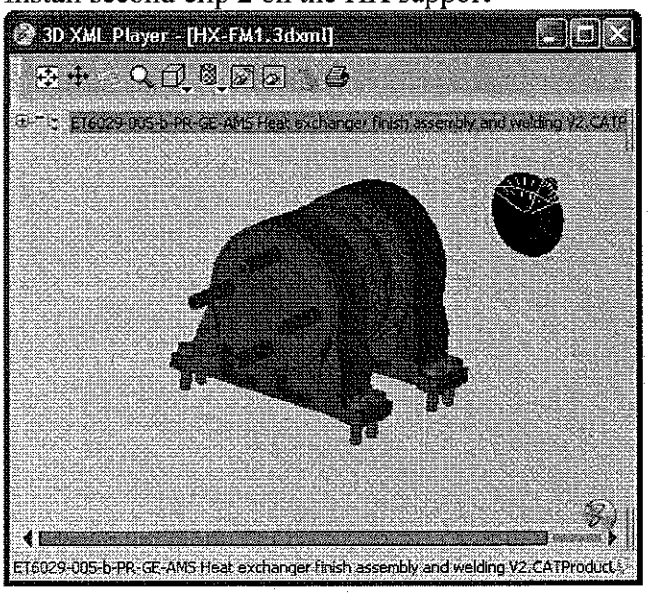
20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	VERIFICATION 23. QA/DV
2.7.7	Machine spacers according to drawing with thickness as measured in above step. 		
2.7.8	Install second clip 2 on the HX support 		
2.7.9	Apply a thin layer of [redacted], to the threads of each bolt prior the installation		
2.7.10	Fasten the screws alternating on both sides by hand and torque to 80% of the total torque.		

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Dash Number	Torque (in*lbf)	
	Max	Min
Screw MS24693-S62	10.6	9

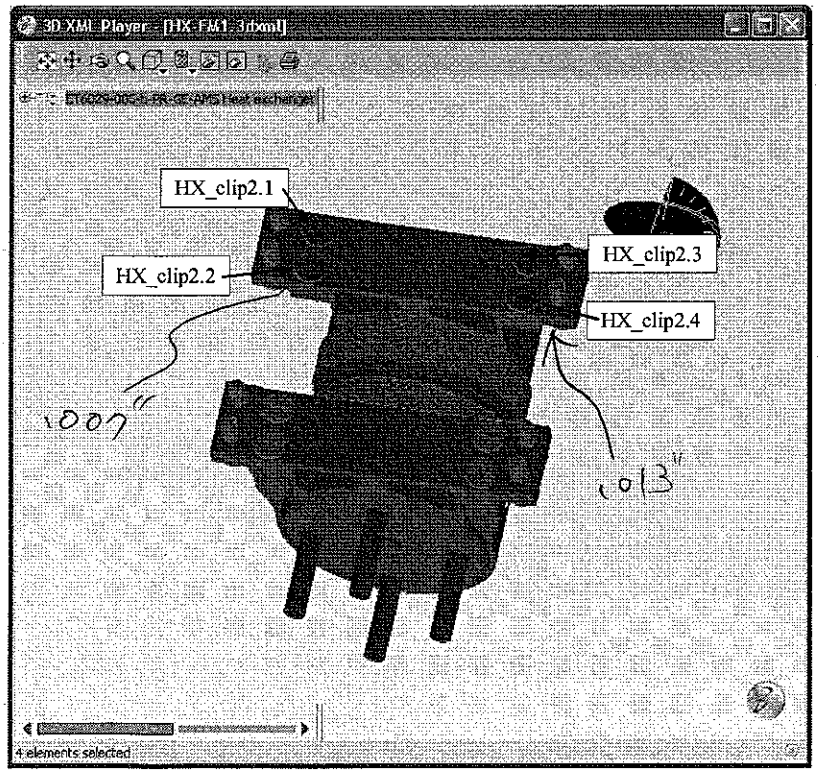
Torque the fasteners installed in Step 2.7.8. Locking torque shall be 1-6 inch*lbf. (TBC) Final torque shall be 80% **final seating torque = 8.48-~~6.75~~ 7.20 inch*lbf above locking torque.**
5% precision on torque.

Torque Wrench- Locking Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009

Torque Wrench- Final Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009



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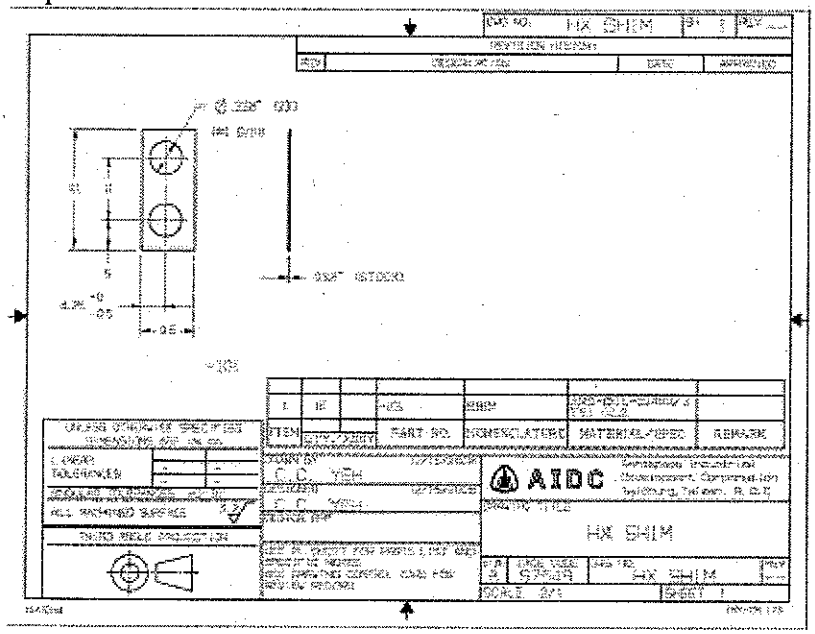
Bolt	Locking Torque	Final Torque (for positioning)
HX-clip2.1	10	18
HX-clip2.2	12	20
HX-clip2.3	9	17
HX-clip2.4	9	17

JCH

C.C. Yeh

2.7.11 Measure the shim thickness between clip and support on both sides of clip 1 with spacers (thickness gauging tools).
Spacer thickness is {(Thickness left + thickness right)-2*0.01"}/2.
In case the spacer thickness < 0.01" use only 1 spacer
In case spacer thickness < 0.005" use no spacers
In case spacer thickness is < 0 machine off the clips so there is a gap of 0.005"

2.7.12 Machine spacers according to drawing with thickness as measured in above step.



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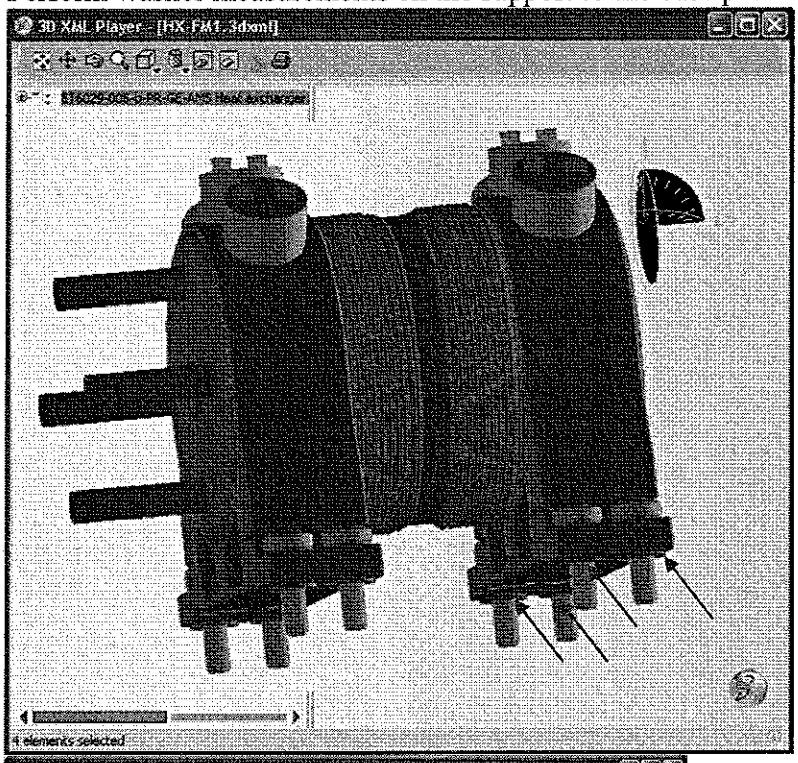
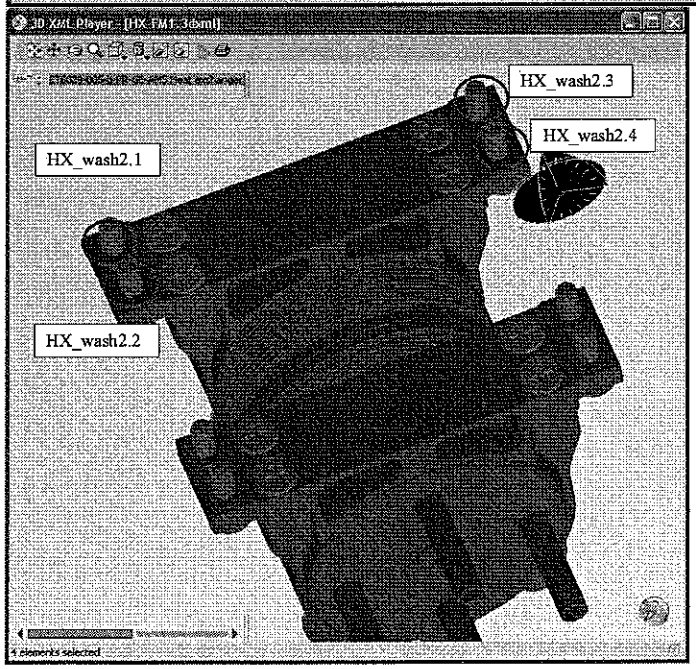
2.7.13	Perform washer measurements on the support to the base plate connection		





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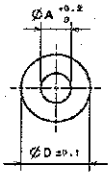
Washer	Thickness
HX-wash2.1	N/A, ~~no gap~~ No spacer
HX-wash2.2	N/A, "
HX-wash2.3	N/A, "
HX-wash2.4	N/A, "

c.c. JCH

2.7.14 Manufacture and washers according to the thicknesses measured in the former step. Starting point is ET5998-06-15.8.



REMOVE SHARP EDGES UNLESS OTHERWISE INDICATED

ROUGHNESS: 3.2

		DXAXT		
15.8	8	THERMAL WASHER 10x5x1.3	Ti6Al4V	
15.7	53	THERMAL WASHER 14x8.7x4	Ti6Al4V	
15.6	11	THERMAL WASHER 14x8.7x3	Ti6Al4V	
15.5	32	THERMAL WASHER 12.8x5x4	Ti6Al4V	
15.4	8	THERMAL WASHER 10x5x5	Ti6Al4V	
15.3	8	THERMAL WASHER 10x5x3	Ti6Al4V	
15.2	8	THERMAL WASHER 10x4.4x5	Ti6Al4V	
15.1	8	THERMAL WASHER 10x4.4x3	Ti6Al4V	
PART NO.	QTY.	PART	MATERIAL	REMARKS

SCALE: 2:1	CHECKED: K.VD.METERING					
DATE: 2008-01-15	APPROVED: J. V. ES					
DESIGNED:		ISSUE	DATE	DRAWN	APPR.	
DRAWN: P. PUL						
PROJECT: AMS TTCS						
SUBJECT: TTCBP FM: THERMAL WASHERS						

NLR NATIONAL AEROSPACE LABORATORY | PROJECT- CHAPTER NO.: ET5998-06 | DWG. NO.: 15 | SIZE: A4 | CATIA DRAWING | ISSUE: —

2.7.15 Unbolt the Clip 1 and Clip 2

2.7.16 END OF OFF-LINE MEASUREMENT STEPS

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2.7.17 OFF-LINE INSTALLATION STEPS

2.7.18 Put the installation dummy plate on a flat surface.

2.7.19 Install the two HX supports on the dummy HX installation base plate as shown in the figure.
Install all 8 bolts washers as on the figure below

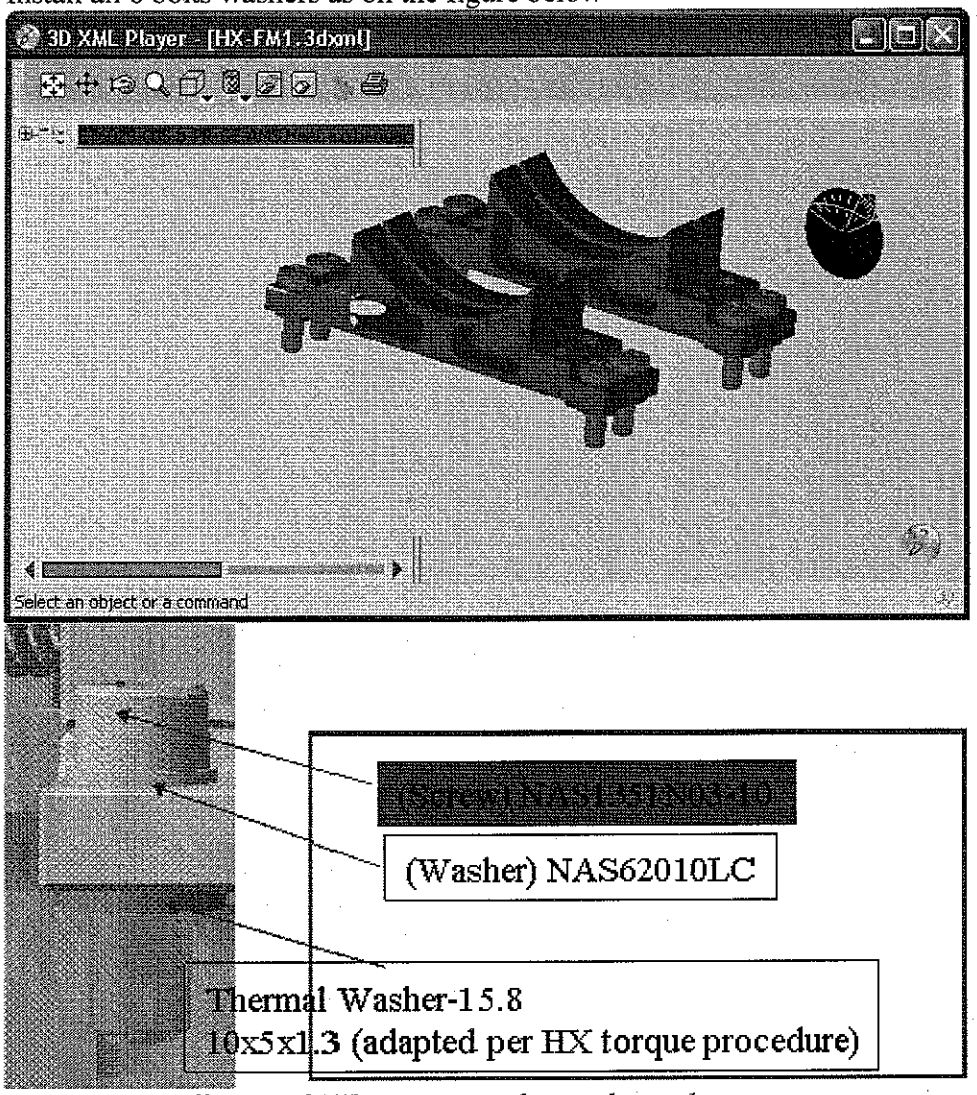

Figure 4: Installation of HX supports to dummy base plate

Install on clip 2 the washers as measured in step 2.7.13.

2.7.20 Apply a thin layer of [redacted], to the threads of each bolt prior the installation (as reported on the assembly drawings).

Braycote Grease - PN _____ Lot#_____ Exp. Date _____

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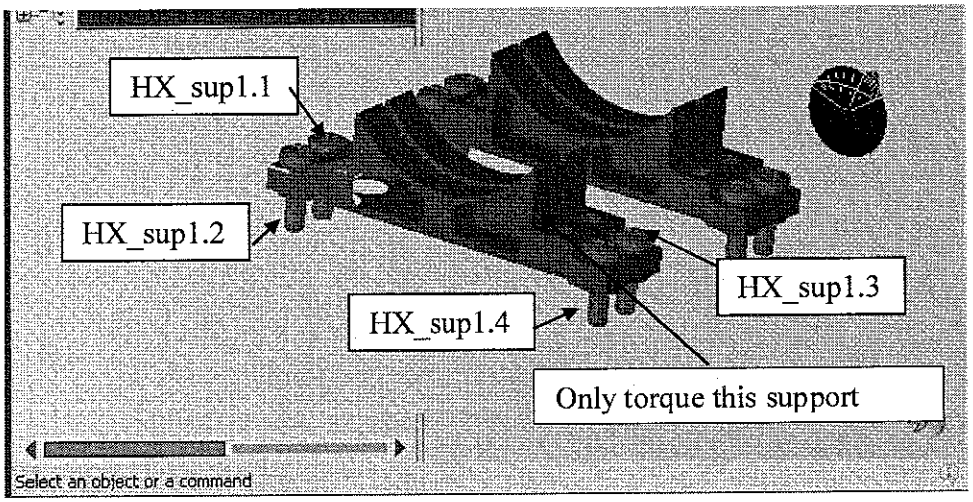
2.8 Torque only the bolts of the support on the side (support 1) where the tubes of the HX will be located to 75% of the final seating value (for positioning).
Final torque values are shown in below table

Dash Number	Torque (in*lbf)	
	Max	Min
Screw NAS1351N3-10	42.2	35.2

Torque the fasteners installed in Step 2.7. Locking torque shall be 1-6 inch*lbf. (TBC) Final torque shall be 75% final seating torque = 31.65-26.93 inch*lbf above locking torque.
5% precision on torque.



Torque Wrench- Locking Torque

PN _____ M# _____ Cal Due Date_____

Torque Wrench- Final Torque

PN _____ M# _____ Cal Due Date_____

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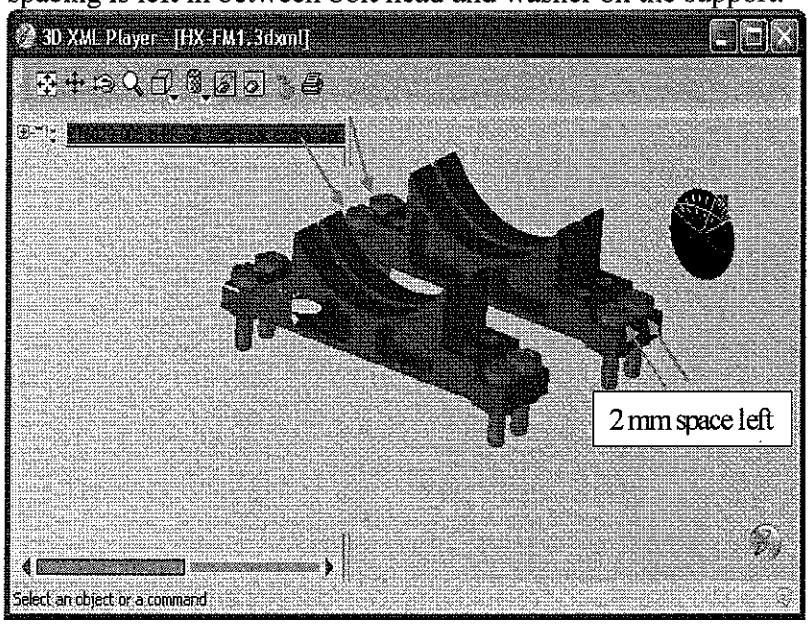
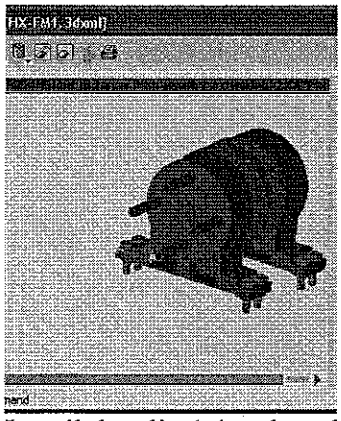
20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	VERIFICATION 23. QA/DV

Bolt	Locking Torque	Final Torque (for positioning)
HX-sup1.1	_____	_____
HX-sup1.2	_____	_____
HX-sup1.3	_____	_____
HX-sup1.4	_____	_____

2.8.1 Leave the bolts on support 2 **untorqued** and screw by hand until 2 mm is spacing is left in between bolt head and washer on the support.



2.8.2 Install the HX on the two-supports
Orient the HX in the correct way according to AD 1.



Install the clip 1 (on the tube side) on the support

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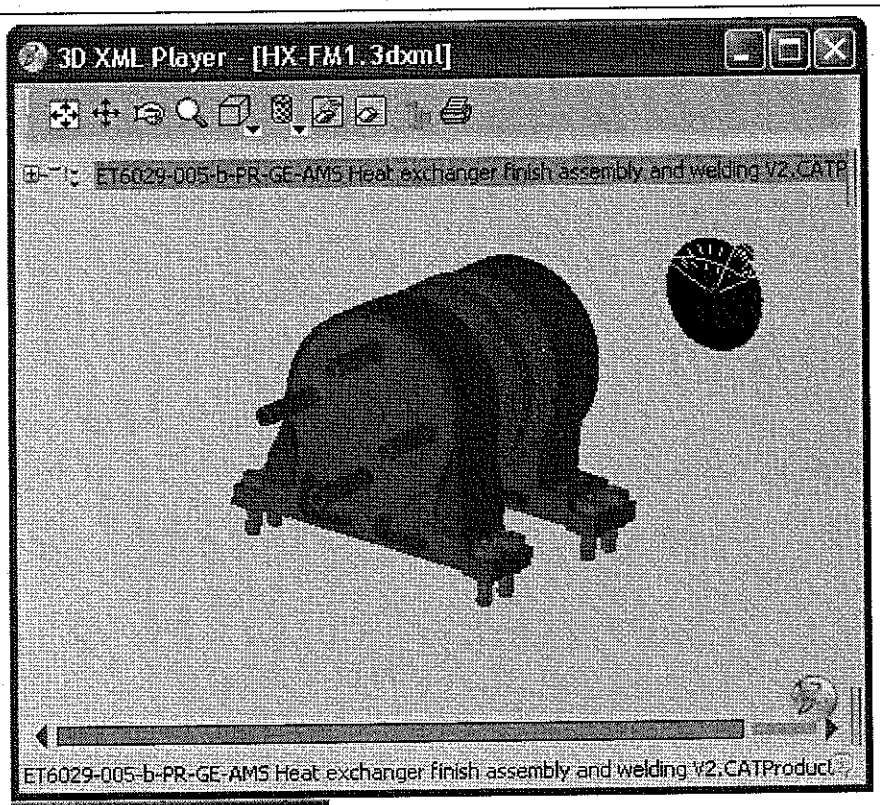

HX Clip shim as per HX torque procedure

(Screw) MS24694C52

2.8.3 Apply a thin layer of [redacted], to the threads of each bolt prior the installation (as reported on the assembly drawings

2.8.4 Fasten the screws alternating on both sides by hand and torque to the final torque value.

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20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	23. QA/DV

Dash Number	Torque (in*lbf)	
	Max	Min
[redacted]	10.6	9

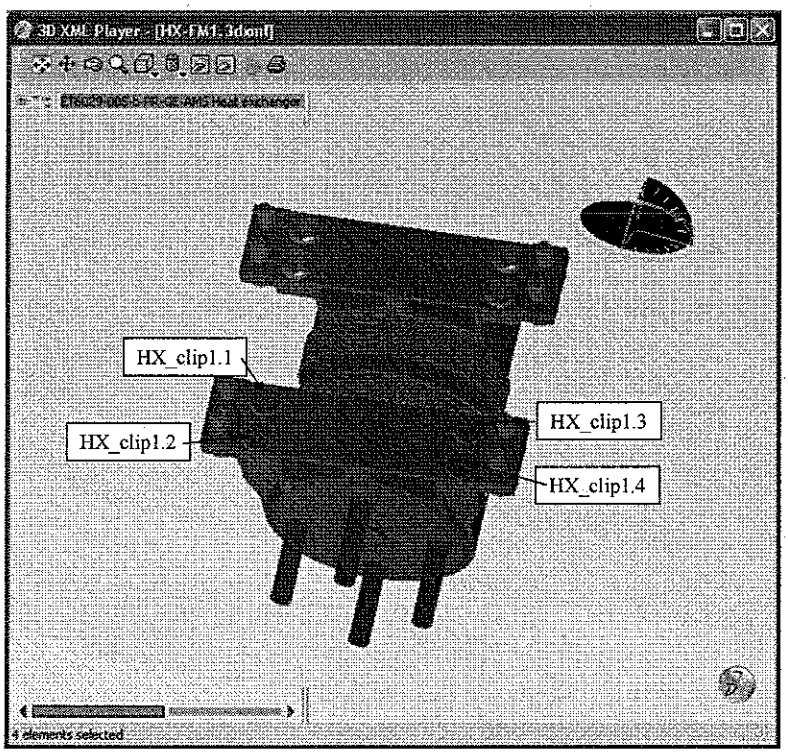
Torque the fasteners installed in Step 2.7.3. Locking torque shall be 1-6 inch*lbf. (TBC) Final torque shall be **final seating torque = 10.6-9 inch*lbf above locking torque.**
5% precision on torque.

2.8.5 Torque Wrench- Locking Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009

Torque Wrench- Final Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009



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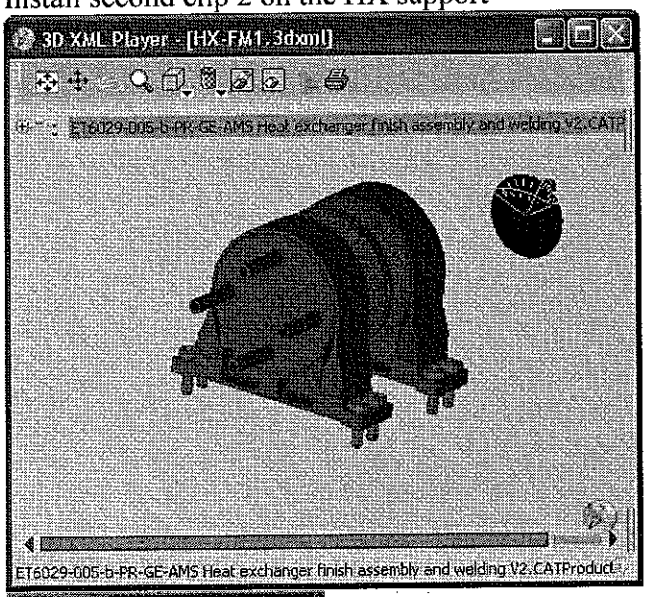
20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	23. QA/DV

Bolt	Locking Torque	Final Torque (for positioning)
HX-clip1.1	11	21
HX-clip1.2	11	21
HX-clip1.3	12	22
HX-clip1.4	10	20

C.C. JCH

JCH

2.8.6 Install second clip 2 on the HX support



HX Clip shim as per HX torque procedure

(Screw) MS24694C52

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20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	VERIFICATION 23. QA/DV

2.8.7 Apply a thin layer of [redacted], to the threads of each bolt prior the installation

2.8.8 Fasten the screws alternating on both sides by hand and torque to the final torque value.

Dash Number	Torque (in*lbf)	
	Max	Min
[redacted]	10.6	9

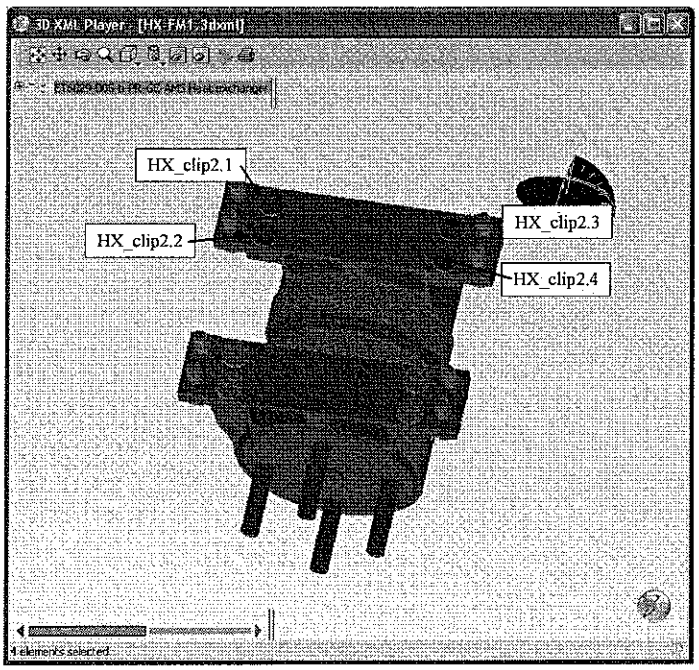
Torque the fasteners installed in Step 2.7.8. Locking torque shall be 1-6 inch*lbf. (TBC) Final torque shall be the **final seating torque = 10.6-9 inch*lbf above locking torque.**
5% precision on torque.

Torque Wrench- Locking Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009

Torque Wrench- Final Torque

PN XQAA0309 M# _____ Cal Due Date 06/22/2009



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20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	23. QA/DV

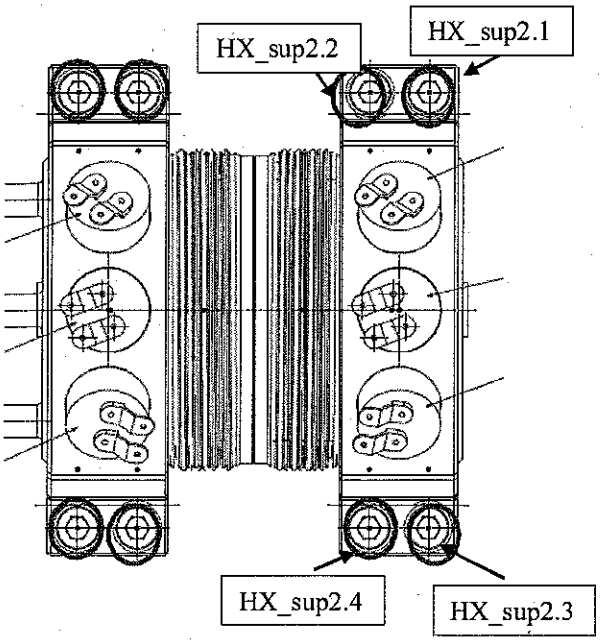
Bolt	Locking Torque	Final Torque
HX-clip2.1	10	20
HX-clip2.2	12	22
HX-clip2.3	9	19
HX-clip2.4	9	19

c.c. Yeh JCH

2.9 Torque the bolts of support 2 to 75% of the final seating value (for positioning). Final torque values are shown in below table

Dash Number	Torque (in*lbf)	
	Max	Min
Screw NAS1351N3-16	12.2	9.9

Torque the fasteners installed in Step 2.7. Locking torque shall be 1-6 inch*lbf. (TBC) Final torque shall be 75% final seating torque = 31.65-26.93 inch*lbf above locking torque.
5% precision on torque.



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Torque Wrench- Locking Torque

PN _____ M# _____ Cal Due Date_____

Torque Wrench- Final Torque

PN _____ M# _____ Cal Due Date_____

Bolt	Locking Torque	Final Torque (for positioning)
HX-sup2.1	_____	_____
HX-sup2.2	_____	_____
HX-sup2.3	_____	_____
HX-sup2.4	_____	_____

2.9.1 END OF OFF-LINE INSTALLATION STEPS

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2.9.2 ON-LINE STEPS

2.10 De-install the TTCS HX from the dummy HX installation plate.

2.11 Prepare the TTCS HX for installation. Perform a visual inspection of the parts to be installed (HX); clean the parts to be installed (HX) with Isopropyl Alcohol and let the parts to be installed dry on the clean towel

2.12 Prepare screws and washer to be used for the part installation. Perform a screws and washer visual inspection; clean screws and washers in an Isopropyl Alcohol bath and let screws and washers dry on a clean towel

2.13 Perform a visual inspection of the TTCS Heat Exchanger; check the cleanliness of all the inserts. If necessary clean them with Isopropyl Alcohol

2.14 Prepare the installation dummy plate for installation. Perform visual inspection and clean the part with Isopropyl Alcohol and let the part dry on a towel.

2.15 Weight all the hardware to be installed, including fasteners. Record the weight

ITEM	WEIGHT
Bolts (NAS1351N3-10)x8	3.18x8 = 25.44 g
Washers (NAS6010LC) x8	0.28x8= 2.24 g
Thermal Washer 15.8 x 8	0.33x8 = 2.64 g
HX (After tube cutting) Added 3M2216	1712.35 g

JCH C.C. 4eh

SCALE
PN AJ-4200E 320107-57 M# _____ Cal Date 08/14/2008

2.16 **INSTALLATION OF HX ONTO THE TTCB BASE PLATE**

WARNING: for HX FM1 installation reference drawings are:

Assembly drawing:..... ET6029-04-DR-031-F
Clip drawing:..... ET6029-04-DR-019.1-H
Support:..... ET6029-04-DR-019.2-H

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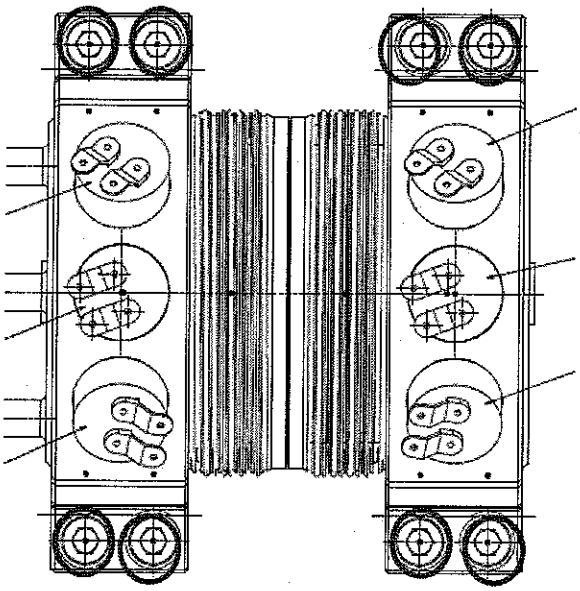
Verify before use the availability of the approved drawing revision

2.16.1 Check the bill of material in the assembly drawing.

2.16.2 Install the two HX supports on the TTCB base plate as shown in the figure below.



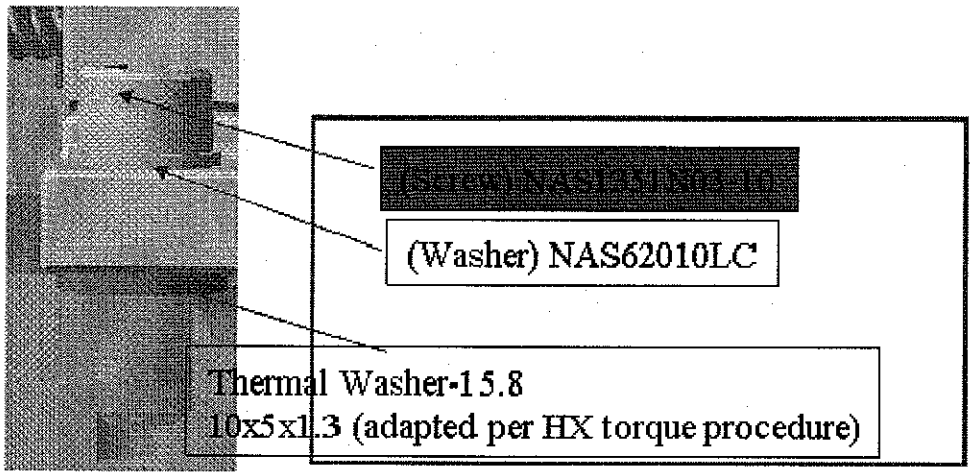


Figure 4: Installation of HX supports to dummy base plate

2.16.3 Apply a thin layer of [redacted], to the threads of each bolt prior the installation (as reported on the assembly drawings).

Braycote Grease - PN 601EF-X102-AMSB Lot# 135999 Exp. Date 06 02 08

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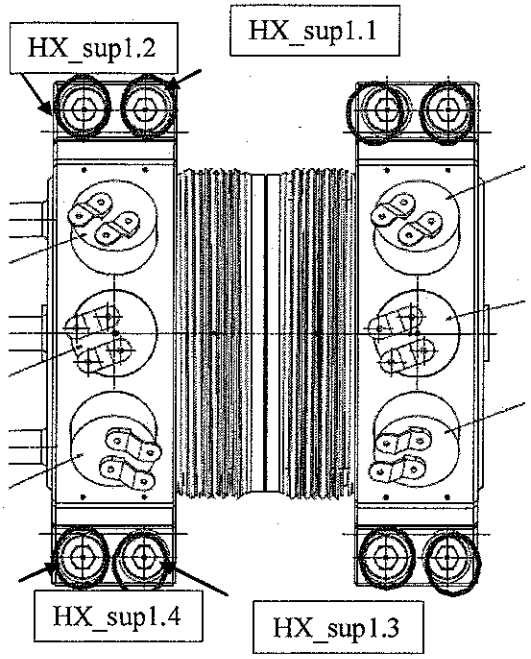
2.17 Install the fasteners as per figure 4 and record fasteners lot number

n.4 BOLTS	NAS1351N03-10	LOT# 44112
n.4 WASHERS	NAS62010LC	LOT# 393911
n.4 WASHERS	ET5998-06-15.8	LOT# N/A

2.18 Torque the bolts of the support on the side where the tubes of the HX will be located to the final seating value. Final torque values are shown in below table

Dash Number	Torque (in*lbf)	
	Max	Min
Screw NAS1351N03-10	42.2	35.9

Torque the fasteners installed in Step 2.7. Locking torque shall be 1-6 inch*lbf. (TBC) Final torque shall be 42.2-35.9 inch*lbf above locking torque.
5% precision on torque.



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20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	VERIFICATION 23. QA/DV

Torque Wrench- Locking Torque

PN XQAA0357 M# _____ Cal Due Date 02/20/2009 05/20/2009

Torque Wrench- Final Torque

PN XQAA0357 M# _____ Cal Due Date 02/20/2009 05/20/2009

Bolt	Locking Torque	Final Torque (for positioning)
HX-sup1.1	13	53
HX-sup1.2	15	55
HX-sup1.3	14	54
HX-sup1.4	15	55

JCH C.C. Yeh

End HX support 1 installation

2.19 Install the fasteners support 2 as per figure 4 and record fasteners lot number

n.4 BOLTS NAS1351N03-10 LOT# 44112

n.4 WASHERS NAS62010LC LOT# 393911

n.4 WASHERS ET5998-06-15.8 LOT# N/A
with thicknesses as determined in off-line step 2.7.13

2.19.1 Apply a thin layer of [redacted], to the threads of each bolt prior the installation (as reported on the assembly drawings).

Braycote Grease - PN 60TEF-X0012.AMSB Lot# 135999 Exp. Date 06 02 08

2.20 Torque the bolts of the **support 2** of the HX to the final seating value. Final torque values are shown in below table

Dash Number	Torque (in*lbf)	
	Max	Min
SCREW NAS1351N3-10	17.2	15.8

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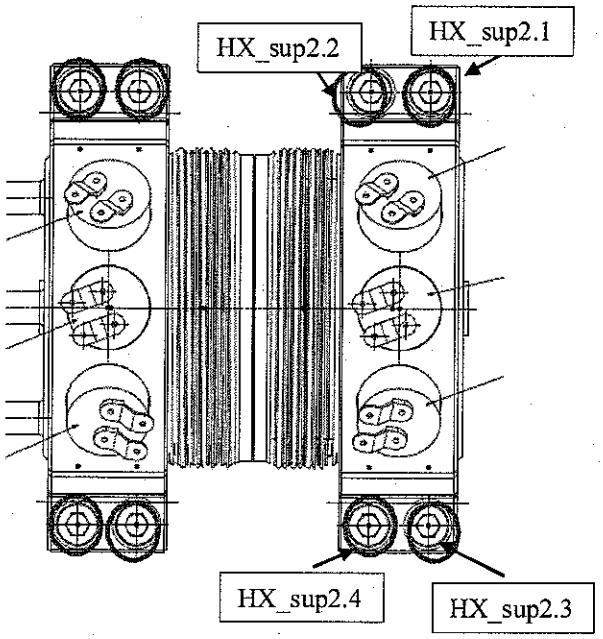
20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFICATION 22. TECH	VERIFICATION 23. QA/DV

Torque the fasteners installed in Step 2.7. Locking torque shall be 1-6 inch*lbf. (TBC) Final torque shall be 42.2-35.9 inch*lbf above locking torque.
5% precision on torque.



Torque Wrench- Locking Torque

PN XQAA0357 M# _____ Cal Due Date 02/20/2009 ~~05/20/2009~~

Torque Wrench- Final Torque

PN XQAA0357 M# _____ Cal Due Date 02/20/2009 05/20/2009

Bolt	Locking Torque	Final Torque (for positioning)
HX-sup2.1	13	53
HX-sup2.2	12	52
HX-sup2.3	~~10~~ 13	40+~~10~~ 13 = ~~50~~ 53
HX-sup2.4	12	52

JCH

C.C. YKH

2.20.1 End of online operations